

Minimally Invasive Laparoscopic Cholecystectomy: A Case Report on Surgical Technique and Postoperative Recovery

Dr. Mahbub Alam^{1*}, Md. Shahidul Islam²

¹Consultant, Department of Surgery, Upazila Health Complex, Gomastapur, Chapai Nawabganj, Bangladesh

²Consultant, Department of Surgery, Upazila Health Complex, Singra, Natore, Rajshahi, Bangladesh

Case Report

DOI: 10.62469/tmb.v02i03.002

***Corresponding Author:**

Dr. Mahbub Alam

Citation:

Mahbub Alam & Shahidul Islam., (2024); Minimally Invasive Laparoscopic Cholecystectomy: A Case Report on Surgical Technique and Postoperative Recovery. *iraetc med. bull*; 2(3) 50-53.



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International license.



Abstract: Laparoscopic cholecystectomy is the gold standard for treating symptomatic cholelithiasis. This case report details the surgical technique, intraoperative findings, and postoperative recovery of a 45-year-old female patient who underwent minimally invasive laparoscopic cholecystectomy. The patient had a history of recurrent biliary colic and was diagnosed with chronic cholecystitis. The surgery was completed successfully without complications, and the patient experienced an uneventful recovery. This report aims to provide insights into the procedural details and highlight the benefits of the laparoscopic approach over open cholecystectomy.

Keywords: Laparoscopic Cholecystectomy, Minimally Invasive.

|| IRAETC Publisher || **Publication History** - Received: 11.05.2024 || Accepted: 23.06.2024 || Published: 30.06.2024 ||

INTRODUCTION

Cholecystectomy, the surgical removal of the gallbladder, is one of the most common abdominal surgeries performed worldwide [1]. The laparoscopic approach has largely replaced open cholecystectomy due to its minimal invasiveness, reduced postoperative pain, shorter hospital stays, and quicker recovery time [2]. This case report presents a detailed account of the laparoscopic cholecystectomy procedure performed on a patient with symptomatic cholelithiasis and chronic cholecystitis, focusing on the surgical technique, intraoperative findings, and postoperative outcomes.

CASE PRESENTATION

The patient is a 45-year-old female with a body mass index (BMI) of 28.5 kg/m², presenting with a six-month history of recurrent episodes of right upper quadrant abdominal pain, often radiating to the back and associated with nausea. The pain typically occurred after meals, especially fatty foods, and was consistent with biliary colic. The patient had no significant past medical history except for mild hypertension controlled with medication. There was no history of jaundice, pancreatitis, or previous abdominal surgery. The patient was afebrile on physical examination, and vital signs were stable. Abdominal examination revealed tenderness in the right upper quadrant, with a positive Murphy's sign. There was no evidence of palpable masses or organomegaly. Laboratory tests were within normal limits, including liver function tests (LFTs), complete blood count (CBC), and serum amylase. An abdominal ultrasound revealed multiple gallstones within the gallbladder, with a thickened gallbladder wall, consistent with chronic cholecystitis.



Figure 2: Surgical Team Performing a Laparoscopic Cholecystectomy

Diagnosis

The patient was diagnosed with symptomatic cholelithiasis and chronic cholecystitis, and laparoscopic cholecystectomy was recommended as the definitive treatment [3].

Surgical Technique

Preoperative Preparation

The patient was placed under general anesthesia, and prophylactic antibiotics were administered. The patient was positioned supine on the operating table with both arms abducted. A pneumoperitoneum was created using a Veress needle, and carbon dioxide (CO₂) was insufflated to achieve an intra-abdominal pressure of 12-15 mmHg.

Port Placement

Four trocars were used for the procedure: a 10-mm trocar was placed at the umbilicus for the laparoscope, a 10-mm trocar in the epigastrium for the surgeon's right-hand instruments, and two 5-mm trocars were placed in the right midclavicular line and right anterior axillary line for additional instruments and retraction [4].

Intraoperative Findings

Upon entering the abdominal cavity, the liver and gallbladder were visualized. The gallbladder was distended with thickened walls, consistent with chronic inflammation. Adhesions between the gallbladder and surrounding structures were noted, which were carefully dissected using sharp and blunt dissection techniques. The Calot's triangle was identified, and the cystic duct and artery were isolated.

Critical View of Safety

The "Critical View of Safety" (CVS) was achieved by clearing the area around the Calot's triangle to ensure that only two structures—the cystic duct and the cystic artery—were entering the gallbladder. This step is crucial to prevent injury to the common bile duct and other vital structures [5]. Once the CVS was confirmed, the cystic duct and artery were clipped with titanium clips and divided.

Gallbladder Removal

After securing the cystic duct and artery, the gallbladder was dissected off the liver bed using electrocautery. Care was taken to minimize bleeding from the liver bed. The gallbladder was then placed in an endoscopic retrieval bag and extracted through the umbilical port site.

Hemostasis and Closure

The gallbladder bed was inspected for hemostasis, and irrigation was performed to ensure a clean field. The pneumoperitoneum was released, and the trocars were removed. The fascial defect at the umbilical port site was closed with absorbable sutures, and the skin incisions were closed with absorbable sutures or staples. A sterile dressing was applied.

Postoperative Recovery

Immediate Postoperative Period

The patient was extubated in the operating room and transferred to the post-anesthesia care unit (PACU). She was monitored for vital signs, pain control, and any signs of immediate postoperative complications. The patient was given

intravenous fluids and analgesics for pain management. She reported minimal pain, which was well-controlled with non-opioid analgesics.

Hospital Stay and Follow-Up

The patient's recovery was uneventful, and she could ambulate and tolerate oral intake by the evening of the surgery. She was discharged on postoperative day 1 with instructions for wound care, pain management, and activity limitations. The patient was advised to follow a low-fat diet temporarily and to avoid heavy lifting for two weeks.

Follow-Up and Outcomes

At the two-week follow-up visit, the patient reported no postoperative complications, such as infection, bile leak, or persistent pain. The surgical wounds had healed well, and she could resume normal activities without discomfort. The patient was highly satisfied with the outcome of the surgery, particularly the minimal postoperative pain and the quick return to daily activities.

DISCUSSION

Laparoscopic cholecystectomy has become the standard of care for treating symptomatic cholelithiasis and chronic cholecystitis due to its minimally invasive nature, reduced postoperative pain, and faster recovery compared to open cholecystectomy [6]. The critical steps in ensuring a safe and effective laparoscopic cholecystectomy include achieving the Critical View of Safety, careful dissection of Calot's triangle, and meticulous hemostasis [7]. Completing the procedure without complications underscores the importance of adhering to established surgical techniques and guidelines. The patient's prompt recovery and satisfaction further highlight the benefits of the laparoscopic approach. The advantages of laparoscopic cholecystectomy over open cholecystectomy are well-documented. These include reduced postoperative pain, shorter hospital stays, quicker return to normal activities, and better cosmetic results due to smaller incisions [8]. Additionally, the risk of complications such as wound infection, incisional hernia, and postoperative ileus is significantly lower with the laparoscopic approach [9]. Despite the numerous advantages, laparoscopic cholecystectomy is not without risks. Potential complications include bile duct injury, bleeding, infection, and conversion to open surgery. Bile duct injury is one of the most serious complications and can lead to significant morbidity if not recognized and managed promptly [10]. In this case, careful dissection and confirmation of the Critical View of Safety helped mitigate the risk of bile duct injury.

CONCLUSION

Laparoscopic cholecystectomy is a safe and effective procedure for treating symptomatic cholelithiasis and chronic cholecystitis. This case report demonstrates the successful application of the laparoscopic technique, resulting in minimal postoperative pain and a quick recovery. The patient's positive outcome reinforces the benefits of minimally invasive surgery in managing gallbladder disease.

REFERENCES

1. Guerra, F., Coletta, D., Gavioli, M., Coco, D., & Patrì, A. (2020). Minimally invasive surgery for the management of major bile duct injury due to cholecystectomy. *Journal of Hepato-Biliary-Pancreatic Sciences*, 27(4), 157-163.
2. Karim, S. T., Chakravarti, S., Jain, A., Patel, G., & Dey, S. (2022). Difficult laparoscopic cholecystectomy predictors and its significance: our experience. *Journal of West African College of Surgeons*, 12(4), 56-63.
3. Mannam, R., Narayanan, R. S., Bansal, A., Yanamaladoddi, V. R., Sarvepalli, S. S., Vemula, S. L., & Aramadaka, S. (2023). Laparoscopic cholecystectomy versus open cholecystectomy in acute cholecystitis: a literature review. *Cureus*, 15(9).
4. Cengiz, Y., Lund, M., Jänes, A., Lundell, L., Sandblom, G., & Israelsson, L. (2019). Fundus first as the standard technique for laparoscopic cholecystectomy. *Scientific Reports*, 9(1), 18736.
5. Battal, M., Yazici, P., Bostanci, O., & Karatepe, O. (2019). Early surgical repair of bile duct injuries following laparoscopic cholecystectomy: the sooner the better. *The Surgery Journal*, 5(04), e154-e158.
6. Durán, M., Silvestre, J., Hernández, J., Briceño, J., Martínez-Isla, A., & Martínez-Cecilia, D. (2023). Learning curve for performing laparoscopic common bile duct exploration in biliary surgery 2.0 era. *Journal of Hepato-Biliary-Pancreatic Sciences*, 30(3), 374-382.
7. Biswas, B., Chowdhury, A. S., Akter, S., Fatema, K., Reem, C. S. A., Tuhin, E., & Hasan, H. (2022). Knowledge and attitude about COVID-19 and importance of diet: A cross-sectional study among Bangladeshi people. *Bangladesh Journal of Food and Nutrition*, 1(1), 04-12.
8. Zhao, J. J., Syn, N. L., Chong, C., Tan, H. L., Ng, J. Y. X., Yap, A., ... & Goh, B. K. (2021). Comparative outcomes of needlescopic, single-incision laparoscopic, standard laparoscopic, mini-laparotomy, and open cholecystectomy: A systematic review and network meta-analysis of 96 randomized controlled trials with 11,083 patients. *Surgery*, 170(4), 994-1003.

9. La Regina, D., Di Giuseppe, M., Cafarotti, S., Saporito, A., Ceppi, M., Mongelli, F., ... & Ferrario di Tor Vajana, A. (2019). Antibiotic administration after cholecystectomy for acute mild-moderate cholecystitis: a PRISMA-compliant meta-analysis. *Surgical Endoscopy*, 33, 377-383.
10. Vincenzi, P., Mocchegiani, F., Nicolini, D., Benedetti Cacciaguerra, A., Gaudenzi, D., & Vivarelli, M. (2024). Bile Duct Injuries after Cholecystectomy: An Individual Patient Data Systematic Review. *Journal of Clinical Medicine*, 13(16), 4837.